

Claims

1. A magnetic resonance imaging apparatus comprising an imaging means for applying high-frequency magnetic fields and gradient magnetic fields to an object to be placed in a static magnetic field in accordance with a pulse sequence of dynamic measurement for continuously obtaining a plurality of time-series images and for measuring NMR signals emitted from the object to be examined, a signal processing means for forming images of a desired tissue of the object to be examined from the NMR signals, a display means for displaying the images and a control means for controlling the imaging means and the signal processing means;

wherein said imaging means is provided with a monitoring mode in which a desired slab of the object to be examined is measured using a pulse sequence for the dynamic measurement under a condition of applying gradient magnetic fields with a low spatial resolution and a substantial measurement mode in which the same slab is measured using the same pulse sequence under a condition of applying gradient magnetic fields with a high spatial resolution, and

said control means has a mode switching means for switching from the monitoring mode to the substantial measurement mode and said switching means switches the monitoring mode to the substantial measurement mode with desired timing during the monitoring mode is performed.

2. The magnetic resonance imaging apparatus of claim 1,

wherein the apparatus is provided with means for extracting reference data from the dynamic measurement data acquired in the monitoring mode, and a temporal change of the extracted reference data is displayed on said displaying means.

3. The magnetic resonance imaging apparatus of claim 2,
wherein said mode switching means switches from the monitoring
mode to the substantial measurement mode when the extracted reference
5 data or the change of the reference data exceeds a predetermined threshold
value.
4. The magnetic resonance imaging apparatus of claim 2 or claim 3,
wherein the reference data is, among the NMR signals acquired in
10 the monitoring mode, a signal value of the origin of the k-space or an
integration of data in the frequency encoding direction including the origin of
the k-space.
5. The magnetic resonance imaging apparatus of claim 2 or claim 3,
15 wherein the reference data is, among the NMR signals acquired in
the monitoring mode, a difference of a signal value of the origin of the k-
space or an integration of data in the frequency encoding direction including
the origin of the k-space from the corresponding value acquired at the
beginning of the monitoring mode.
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6. The magnetic resonance imaging apparatus of any one of claims 1-5,
wherein said control means controls said signal processing means,
when images are reconstructed immediately after the substantial
measurement mode begins, so as to reconstruct images using data including
25 data acquired in the pulse sequence performed previously.
7. The magnetic resonance imaging apparatus of any one of claims 1-6,
wherein data of the time-series images is three-dimensional data and
transformed to a two-dimensional projected image to be displayed on said

display means.

8. The magnetic resonance imaging apparatus of any one of claims 1-7,
wherein said mode switching means has an input means for mode
5 switching, and the monitoring mode is switched to the substantial
measurement mode by directly inputting a switching instruction to said
mode switching means.
9. The magnetic resonance imaging apparatus of any one of claims 1-8,
10 wherein the gradient magnetic fields include a slice encode, a phase
encode and a frequency encode for the two-dimensional or three dimensional
measurement, and under the condition of applying gradient magnetic fields
with low spatial resolution one or both of the slice encode and the phase
15 encode is omitted and under the condition of applying gradient magnetic
fields with high spatial resolution one or both of the slice encode and the
phase encode is imparted.
10. The magnetic resonance imaging apparatus of claim 9,
wherein the dynamic measurement performed by said imaging
20 means is blood imaging for observing a change of blood flow using a contrast
agent, where the slice encode is omitted in the monitoring mode to obtain
two-dimensional images and the slice encode is added in the monitoring
mode to obtain three-dimensional images.
- 25 11. The magnetic resonance imaging apparatus of claim 9,
wherein a difference image between the blood images acquired before
and after injection of the contrast agent is displayed on said displaying
means.